1. An apparatus for thermally affecting tissue, comprising:

an implantable member having an outer surface configurable to contact the tissue; and

at least one fluid-tight lumen defined by the implantable member, the fluid-tight lumen being in thermal communication with the outer surface of the implantable member and being configured to receive a thermally transmissive fluid to thereby impart a thermal change to the outer surface of the implantable member.

2. The apparatus of claim 1, wherein the thermally transmissive fluid is selected from the group consisting of liquid, gas and a combination thereof.

3. The apparatus of claim 1, wherein the implantable member has a shape selected from the group consisting of substantially circular, substantially elliptical, substantially oval, substantially square, substantially trapezoidal and substantially rhomboid.

4. The apparatus of claim 3, wherein at least a portion of the implantable member is looped around itself to approximately resemble a coil shape.

5. The apparatus of claim 1, wherein the implantable member is formed from a flexible, heat conductive, biocompatible material.

6. The apparatus of claim 5, wherein the implantable member is formed from a silicone elastomer.

7. The apparatus of claim 1, wherein the implantable member is adapted for thermally transmissive contact with epidural brain tissue.

8. The apparatus of claim 1, wherein the implantable member is adapted for direct thermally transmissive contact with subdural brain tissue.

9. The apparatus of claim 1, further comprising:

a backing member attached to the implantable member such that the backing member is in thermal contact with the tissue.

10. The apparatus of claim 9, wherein the backing member is made of a thermally transmissive material, the thermally transmissive material being resistant to adherence to the tissue.

11. The apparatus of claim 10, wherein the backing member is made of silicone.

12. The apparatus of claim 1, further comprising:

a temperature measurement element having a first end positioned in proximity to the implantable member and a second end in communication with a temperature indication element.

13. The apparatus of claim 12, wherein the first end of the temperature measurement element is positioned within the at least one fluid-tight lumen, and wherein the temperature indication element indicates the temperature of the thermally transmissive fluid.

14. The apparatus of claim 12, wherein the first end of the temperature measurement element is positioned between the implantable member and the tissue, and the temperature indication element indicates the temperature of the tissue.

15. The apparatus of claim 1, further comprising:

a pressure measurement element having a first end positioned in proximity to the implantable member and a second end in communication with a pressure indication element.

16. The apparatus of claim 15, wherein the first end of the pressure measurement element is positioned between the implantable member and the tissue.

17. The apparatus of claim 15, wherein the pressure indication element is in communication with a warning indicator such that the warning indicator is effective to produce a signal upon the measurement of a predetermined pressure level by the pressure measurement element.

18. The apparatus of claim 17, wherein the signal is selected from the group consisting of a visual signal, an audio signal, and a combination thereof.

19. The apparatus of claim 1, wherein the implantable member is constructed of a shape memory material.

20. An apparatus for thermally affecting tissue, comprising:

a plurality of implantable members, each of which includes an entry port and an exit port and an internal fluid-tight lumen defined therebetween, the internal lumen being effective to communicate a thermally transmissive fluid through the internal lumen, out of the exit port, and directly onto the tissue; and

a fluid transport element in communication with the entry port of the internal lumen, the fluid transport element adapted to supply the thermally transmissive fluid to at least one of the plurality of implantable members.

21. The apparatus of claim 20, further comprising:

a suction source in communication with the internal lumen, the suction source adapted to supply a suction force through the internal lumen, the suction force being effective to retrieve a quantity of thermally transmissive fluid from the tissue, to cause the quantity of thermally transmissive fluid to enter into the exit port and to travel through the internal lumen and out of the entry port into a fluid collection area.

22. The apparatus of claim 20, wherein the thermally transmissive fluid is selected from the group consisting of water, saline and a mixed fluorocarbon solution.

23. The apparatus of claim 20, wherein the thermally transmissive fluid includes a neuroprotective agent.

24. An apparatus for thermally affecting tissue, comprising:

a plurality of implantable members, each of which includes first and second fluid-tight internal lumens, each first internal lumen including a first entry port and a first exit port, each first exit port adapted to be positioned proximate tissue, and each second internal lumen including a second entry port and a second exit port, each second entry port being positioned proximate the tissue;

a fluid transport element in communication with the first entry port of the first internal lumen of at least one of the plurality of implantable members and adapted to supply thermally transmissive fluid to the first internal lumen such that the thermally transmissive fluid travels through the first internal lumen, out the first exit port, and onto the tissue; and

a suction source in communication with the second exit port of the second internal lumen of at least one of the plurality of implantable members and adapted to suction thermally transmissive fluid from the tissue into the second entry port, through the second internal lumen, and out the second exit port.

25. The apparatus of claim 24, wherein the thermally transmissive fluid is selected from the group consisting of water, saline and a mixed fluorocarbon solution.

26. The apparatus of claim 24, wherein the thermally transmissive fluid includes a neuroprotective agent.

27. An apparatus for thermally affecting tissue, comprising:

an implantable member including an internal lumen, a tissue facing first surface and an opposing second surface, the first surface including at least one opening adapted to deliver thermally transmissive fluid to the tissue, and the second surface including at least one opening adapted to provide a suction return for thermally transmissive fluid; and

a fluid transport element in communication with the internal lumen, the element adapted to supply the thermally transmissive fluid to the device such that thermally transmissive fluid is able to travel through the internal lumen and out at least one of the first surface openings and directly onto the tissue.

28. The apparatus of claim 27, wherein the implantable member is substantially umbrella-shaped.

29. A method of thermally affecting tissue of a patient, comprising the steps of:

positioning an implantable element in thermal communication with the tissue, the element being comprised of substantially fluid-tight coils;

circulating thermally transmissive fluid through the fluid-tight coils of the implantable element; and

allowing the element to thermally affect the tissue to a predetermined temperature for a predetermined time.

30. The method of claim 29, further comprising the step of:

prior to positioning the implantable element, penetrating the patient's body to provide a work area in proximity to the tissue, the work area having sufficient dimensions to allow for positioning of the implantable element thereat.

31. The method of claim 30, wherein the work area is provided in epidural brain space of the patient.

32. The method of claim 30, wherein the work area is provided in subdural brain space of the patient.

33. The method of claim 30, further comprising the steps of:

inserting a retraction device into the patient's body, the retraction device being in a non-expanded condition; and

causing the retraction device to assume an expanded condition effective to create the work area,

wherein each of these steps are performed following the step of penetrating the patient's body but before the step of positioning the implantable element.

34. A method of cooling brain tissue, comprising the steps of:

retracting a quantity of brain tissue from brain dura over a region having sufficient dimensions for positioning of an implantable cooling element thereat;

positioning an outer surface of an implantable cooling device in the region in direct thermal contact with brain tissue, the cooling device including a plurality of substantially loop shaped, fluid-tight coils, an internal lumen, and at least one temperature measuring element;

circulating coolant through the internal lumen and into at least some of the coils; and

allowing the device to cool the brain tissue to a predetermined temperature for a predetermined time, the predetermined time being at least partially based on temperature measurements of the at least one temperature measuring element.

35. A method of cooling brain tissue, comprising the steps of:

providing an implantable member made of a shape memory material, the implantable member having a predetermined at-rest shape;

placing the implantable member over a guidewire such that the implantable member substantially conforms to the shape of the guidewire;

positioning the guidewire in proximity to brain tissue;

removing the guidewire such that the implantable member returns to its at-rest shape in proximity to the brain tissue;

circulating coolant through the implantable member; and

allowing the implantable member to cool the brain tissue to a predetermined temperature for a predetermined time.

36. The method of claim 35, wherein, following the step of removing the guidewire, the implantable member is in direct contact with the brain tissue.

37. The method of claim 35, further comprising the step of:

prior to positioning the guidewire in proximity to brain tissue, penetrating the patient's scalp and skull to provide a work area in proximity to brain tissue, the work area having sufficient dimensions to allow for positioning of the implantable member thereat.

38. The method of claim 37, wherein the work area is provided in epidural brain space of the patient.

39. The method of claim 37, wherein the work area is provided in subdural brain space of the patient.

40. The method of claim 37, further comprising the steps of:

inserting a retraction device into the patient's skull, the retraction device being in a non-expanded condition; and

causing the retraction device to assume an expanded condition effective to create the work area,

wherein each of these steps are performed following the step of penetrating the patient's scalp and skull but before the step of positioning the cooling element.

41. An apparatus for cooling brain tissue, comprising:

a cooling body having a cooling fluid supply configured for connection to a cooling fluid source local external to the patient's skull, the cooling body including a cooling region configured to reside within the skull of the patient, wherein the cooling body is configured to distribute cooling fluid substantially over the cooling region to provide direct thermal contact for cooling a region of brain tissue adjacent thereto.

42. The apparatus of claim 41, wherein the cooling body defines a closed coolant path that cools by contact through the cooling body.

43. The apparatus of claim 41, wherein the cooling body defines an open coolant path that cools by irrigation.